



PC SYSTEMS FAQ

Q Please can you tell me how ATI's multi-card CrossFire works?

A CrossFire lets you use two graphics cards together in a single PC to improve performance in 3D games. The technology is ATI's answer to nVidia's similar SLI system, although they differ in the way they work and the hardware you need to use them.

To use CrossFire, you need a motherboard with the correct chipset. Currently Intel i955X and ATI Radeon Xpress 200 motherboards support it. You also need a motherboard with two PCI-E x16 slots to house both graphics cards.

Next, you need two graphics cards. While SLI needs two identical cards to work, CrossFire lets you mix and match cards with different levels of performance, although one of them must be a CrossFire-edition card. However, when you use cards with different numbers of pixel pipelines, both cards operate with the lesser card's number of pipelines. So if you use one card with 16 pixel pipelines and one with 12, both cards operate with 12 pixel pipelines. However, each runs at its native clock speed.

The CrossFire card has an additional processor on it that combines the partial images from both cards into a single onscreen image. Data is transferred through an external DVI cable rather than an internal connector like nVidia's SLI bridge.

Once the cards are connected, the graphics workload is split between them. The default mode is called Supertiling, which splits the screen into lots of small tiles. Each card is then passed a number of tiles to process, and the results are merged to create a single picture. Different modes will become available, such as alternate frame rendering, where each card renders alternate complete frames. Our review above right shows how CrossFire performs.

For more on CrossFire, see our FAQ for *What's New Components*.

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The CrossFire technology aims to improve 3D gaming

REVIEW DESKTOP PC

CUBE 24/7 Serpens

RATING ★★★★★

PRICE £1,799 inc VAT

SUPPLIER Cube 24/7 0870 242 1179

DETAILS www.cube247.co.uk

NVidia released its dual-card SLI graphics technology over a year ago, so it was only a matter of time before ATI made its own version. Despite several delays, CrossFire is finally here, and installed in Cube's Serpens PC. Our PCs FAQ tells you all you need to know about CrossFire.

For this system, Cube installed two 256MB ATI Radeon X800 XL graphics cards. This is an excellent choice, as a single X800 XL offers a fine balance between price and performance. Two of these cards working in tandem provide excellent performance, as our benchmark results show. Our test resolution didn't push the cards, so we bumped the Doom 3 test up to 1,280x1,024, and still the Cube managed a score of 73.5 frames per second (fps). One X800 XL is capable of 42.7fps in Doom 3, which makes the CrossFire mode around 70 per cent faster. This is impressive and similar to the speed increase we'd expect from an nVidia SLI-based system.

Cube's Serpens can run at 1,600x1,200 too, achieving a score of 54.2fps in Doom 3. This is good, if a bit behind nVidia's GeForce 7800 GTX. But you won't be able to run games at this resolution, as Cube provides only a 19" GNC LCD monitor, with a maximum resolution of 1,280x1,024. For this type



of system, a 20" LCD would be more appropriate. That said, the monitor's quality isn't bad and the screen is evenly lit with good viewing angles.

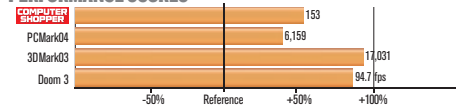
We weren't convinced by Cube's choice of a dual-core AMD Athlon 64 X2 4400+ processor (two Athlon 3500+ processors on a single chip). It does well in our 2D benchmarks, which take advantage of both processor cores, but today's games use only a single core, so it's like having a single-core Athlon 64 3500+. We'd have preferred a fast single-core processor, such as an Athlon 4000+, and a larger monitor to provide greater balance. Two Seagate 200GB SATA hard disks, configured for RAID 0 striping, provide 400GB of fast storage, though if one disk dies you'll lose all your data. Luckily, the NEC ND3540 two-layer DVD drive provides a handy way of backing things up.

Sound is as important as visuals in a gaming PC, and Cube has recognised this, choosing the excellent combination of Creative's Audigy 2 ZS sound card and 7900 7.1 surround-sound speakers.

The Serpens demonstrates CrossFire's potential well, but Cube could have made better choices for the processor and monitor.

David Ludlow

PERFORMANCE SCORES



✓ Fast graphics

✗ Only a 19" LCD; dual-core processor is not ideal for games

SPECIFICATIONS AMD Athlon 64 X2 4400+ processor, 1GB of RAM, 2x 200GB hard disks, NEC ND3540 DVD+/-RW +/-DL, Creative Audigy 2 ZS sound card, 2x 256MB ATI Radeon X800 XL graphics cards, 19" LCD

HOTLIST DESKTOP PC

GLADIATOR Jupiter 6600GT

RATING ★★★★★

PRICE £799 inc VAT

SUPPLIER Gladiator 08456 444666

DETAILS www.gladiatorcomputers.com

Gladiator's Jupiter 6600GT is a powerful, well-built PC system that is easy to upgrade. It comes in a smart silver-fronted case. Its Logitech keyboard and mouse are particularly impressive: both are wired, but they are well made and comfortable to use.

Using an Athlon 64 3500+, 1GB of RAM and an nVidia GeForce 6600 GT graphics card, the Jupiter scored highly in our benchmark tests, with 121 in our application benchmarks and 41.8fps in Doom 3. The PC uses an SLI motherboard, so you can upgrade its graphics performance later by adding a second 6600 GT graphics card.

This is an excellent PC. Its processor, memory and graphics card are very good for the money,



and you can upgrade to SLI in the future. However, we so have concerns about the return-to-base warranty. If you can't be without your PC, we recommend you look for one with onsite cover.

SPECIFICATIONS AMD Athlon 64 3500+ processor, 1GB RAM, 160GB hard disk, 128MB nVidia GeForce 6600GT graphics, DVD+/-RW DL, DVD-ROM, 17" LCD

REVIEW **DESKTOP PC****ESYS**
Asda PC Tower

RATING ★★

PRICE £280 inc VAT

SUPPLIER ASDA

DETAILS In store only

Supermarkets sell more than just food these days; now their range extends to computers. Asda is offering a bare-bones budget PC from eSys that's designed to give parents a cheap way of buying their children a PC for school work.

At less than £300, the eSys seems cheap, but it comes without a monitor so you'll have to budget for one unless you already have a spare. The bundled peripherals are disposable: the creaky keyboard, jerky ball mouse and weedy speakers should all be replaced, adding further expense.

For web browsing and basic office productivity tasks, the eSys's modest performance, courtesy of a 2.4GHz Intel Celeron D processor, is more than sufficient but leaves little potential for advanced tasks such as image editing and 3D games. This isn't helped by the restrictive warranty, which is voided if you try to upgrade your PC – a severe limitation given the paltry 256MB of memory installed. The 40GB hard disk will quickly feel limited, but this is alleviated slightly by the six USB2 ports, which allow you to add external hard disks.

None of this would matter if the eSys were dirt-cheap and therefore good value for what you get. Unfortunately for Asda, Tesco and PC World sell



systems for around the same price that include bigger hard disks, CRT monitors and even luxuries such as DVD writers and memory card readers.

The eSys isn't a complete washout. The black metal case feels very solid and an Ethernet port is provided for connecting to broadband. The one-year warranty, while restrictive with regards to upgrades, provides for onsite service in your own home. The software bundle is basic, but includes Microsoft Works 8, Nero Express 6, PowerDVD 5 and BullGuard 5 anti-virus software.

Despite the PC's apparent cheapness, we're not convinced it offers great value. The lack of monitor is odd; this isn't a PC you'd buy as an upgrade while keeping all your old peripherals. When you include the cost of a monitor and a decent keyboard and mouse, you add at least another £150 to the price. The harsh policy that invalidates the warranty if you try to upgrade the eSys is very unfair and will deter many people. The eSys is really suitable only for basic office tasks and homework, and those types of users will find better value elsewhere.

Alan Lu

PERFORMANCE SCORES

✓ Good build quality

✗ Poor performance; small disk; restrictive warranty

SPECIFICATIONS Intel Celeron D 2.4GHz processor, 256MB RAM, 40GB hard disk, Intel 82845G integrated graphics, DVD-ROM/CD-RW

HOTLIST **DESKTOP PC****PC NEXTDAY**
Zoostorm 6607

RATING ★★★★★

PRICE £888 inc VAT

SUPPLIER sales@pcnextday.co.uk

DETAILS www.pcnextday.co.uk

This PC is an all-round entertainer with something for everyone. The 6600GT graphics card is capable of playing all the latest games with smooth frame rates, while the hybrid TV card can receive, record and pause live analogue or digital TV. A large 250GB hard disk and DVD writer are included for archiving favourite shows, and DVD software is provided for watching movies. All this media comes to life with the large 19" LCD monitor and stereo speakers provided.

The Zoostorm 6607 is no slouch in the power stakes either. Its AMD Athlon 3500+ processor is paired with a generous 1GB of RAM. This made short work of our *Shopper* benchmarks, producing



an overall score of 106. For entertainment or work the Zoostorm is a great system for the money. Our only reservation is the limited one-year return-to-base warranty; an onsite warranty is preferable for most users.

SPECIFICATIONS AMD Athlon 64 3500+, 1GB RAM, 250GB hard disk, 128MB nVidia GeForce 6600GT graphics, DVD+/-RW +/-DL and DVD-ROM, 19" LCD



Our round-up of the best new gadgets and software

AMACROX
NB Kit

RATING ★★

PRICE £24 inc VAT

SUPPLIER www.microdirect.co.uk

DETAILS www.amacrox.com

The NB Kit consists of four gadgets for notebook owners: a mouse, an LED light, a USB hub and a combined earphone and mic set. All but the light have retractable cables. The flash drive-sized USB mouse provides tactile feedback, but the tracking and acceleration are jerky. The clip-on LED light draws power from a USB port, but the illumination is weak. The four-port USB 1.1 hub is an odd choice given the prevalence of USB2. The combined earphone and microphone's cable is too short, the sound quality is poor and the mic had trouble picking up even the loudest sounds. Given the poor quality of this set, it would be better to buy equivalent gadgets separately.



Alan Lu

ZALMAN
ZM80D-HP/ZM-OP1 Bundle

RATING ★★★★★

PRICE £31

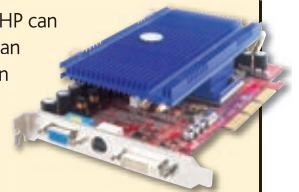
SUPPLIER www.quietpc.com

DETAILS www.zalmantech.com

Zalman's XM80D-HP can cool cards such as an ATI Radeon 9800 in complete silence. It works with more powerful graphics cards such as the 9800 Pro, but for this you'll need the ZM-OP1 fan too. The ZM80D-HP mounts on all cards with the standard two push-pin mounting holes, but fitting it is tricky. At times you seem to require three or four hands. We managed to fit it in half an hour.

Once the ZM80D-HP was attached, our graphics card ran in complete silence; using the ZM-OP1 created a lot of noise on the fan's higher setting, but its lower setting was silent.

The ZM80D-HP is a great way to keep an older graphics card quiet, and with the ZM-OP1 fan is effective for hotter cards too.



Tom Royal



BYTE SIZE!



Our round-up of the best new gadgets and software

WACOM Graphire Bluetooth

RATING ★★★★★

PRICE £175 inc VAT

SUPPLIER www.savastore.com

DETAILS www.wacom-europe.com/uk

This Graphire graphics tablet connects to your PC using Bluetooth rather than the usual USB. The battery-powered A5-sized tablet must be paired with a Bluetooth dongle before you can use it wirelessly, but Wacom doesn't provide one. The Graphire's wireless range is limited more by monitor size and eyesight than Bluetooth technology, though a poor-quality Bluetooth dongle can reduce the range and make the drawing sensation feel less natural.

The pressure-sensitive pen takes a bit of getting used to, but the bundled mouse and Corel Painter Essentials 2 software are good. However, the lack of a dongle and the £50 premium over similar USB models makes this poor value.

Alan Lu



Flash Gordon



RATING ★★★★★

PRICE £15

DETAILS www.play.com

To watch *Flash Gordon* is to consider the very nature of movies. Should they have a coherent plot, believable characters and a carefully crafted script that draws you into the narrative? Or should they forgo all these things in favour of outrageous hamming, massive amounts of camp and lots of bright colours? Most people would say the former, but there's a reason why *Flash* retains an enduring popularity, as is proved by this shiny new 25th Anniversary Special Edition. Just sit back and enjoy the Queen soundtrack, the garish sets, the ludicrous action scenes and Brian "Gordon's alive?!" Blessed in his signature role. The disc includes commentaries by Blessed and director Mike Hodges, a 30-minute interview with Hodges and an episode from the 1930s *Flash* serial.

Chris Miller



REVIEW MEDIA CENTRE PC

MESH Cubex X1

RATING ★★★★★

PRICE £1,220 inc VAT

SUPPLIER Mesh Computers 08700 464747

DETAILS www.meshcomputers.com

It's been ages since ATI updated its All-In-Wonder series, and the company has been slow to introduce a PCI-E version of its card. Finally, the wait is over and the ATI All-In-Wonder X800GT is here.

Mesh has chosen this card for its Cubex X1, an attractive, compact and well-built media centre PC. Instead of installing Windows XP Media Center Edition, Mesh has opted for ATI's Multimedia Center software and bundled remote control. This is easy to set up. The All-In-Wonder offers analogue and digital TV tuners, so you can receive TV even if you live in an area with poor digital reception.

Multimedia Center is easy to use, and the remote control makes navigating through the application's interface a breeze. You can pause live TV, record the programme you are watching and record an analogue channel while watching a Freeview channel, and vice versa. Sadly, there's no built-in Electronic Programme Guide (EPG), one of the key features of Microsoft's Media Center. If you want one, you must pay for a TVTV subscription.

If you don't fancy paying the yearly £15 subscription fee, you can schedule recordings manually as if you were programming a video recorder. You can't use the remote control for this,



though, and must switch to a separate Windows application. The process is not very intuitive, and you often have to double-check the settings as they sometimes fail to stick. You can watch TV in an Internet Explorer sidebar, a transparent window or even on your desktop by replacing your wallpaper with a live TV feed, which is fun if a bit gimmicky.

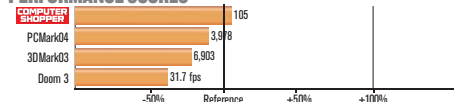
The Cubex managed a playable frame rate in our Doom 3 test, but as the X800GT has just eight-pipelines and 128MB RAM it is happier at lower resolutions. Still, it's fine for the occasional game.

SCART, S-video and composite ports are available on two plug-in dongles, and Mesh includes CyberLink's PowerDirector Express video editing software plus two FireWire 400 ports to connect a DV camcorder. PowerDirector Express is easy to use but lacks the versatility of Premiere Elements.

Mesh deserves credit for bundling a selection of quality peripherals, including a ViewSonic VX924 19" LCD, Creative Inspire T7900 7.1 surround-sound speakers and Logitech rechargeable wireless optical mouse and wireless keyboard. However, there are faster gaming PCs and better media centre PCs available for less money.

Alan Lu

PERFORMANCE SCORES



✓ Analogue and digital TV tuners; good quality bundled peripherals; attractive design

✗ Unsophisticated TV recording; disappointing 3D performance

SPECIFICATIONS AMD Athlon 64 3500+ processor, 1GB RAM, 200GB hard disk, 128MB ATI All-In-Wonder Radeon X800GT graphics, DVD+/-RW +DL, DVD-ROM, 19" LCD

HOTLIST DESKTOP PC

MESH Matrix Eclipse CS Xtra

RATING ★★★★★

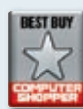
PRICE £799 inc VAT

SUPPLIER Mesh 08700 464747

Mesh's Matrix Eclipse CS Xtra comes with an excellent 17" LCD and is a good all-rounder. The quality of the ViewSonic VP171b is likely to sway those interested in digital art, though. It produces accurate colours with smooth transitions and greyscales, can swivel for use in portrait mode and is also ideal for gaming.

With its set of Creative Inspire P5800 5.1 surround-sound speakers, the Eclipse is also an excellent choice for gaming and watching DVDs.

Performance is pretty good across the board, with an AMD Athlon 64 3200+ providing enough power for standard 2D applications. A 256MB ATI Radeon X800 graphics card won this PC a score of



39.8fps in Doom 3, so it's good enough to handle the latest games as well.

This is a powerful, well-rounded system and an excellent buy.

SPECIFICATIONS AMD Athlon 64 3200+ processor, 1GB RAM, 200GB hard disk, 256MB ATI Radeon X800 graphics, DVD+/-RW +/-DL, 17" LCD



CHOOSING A...

PC SYSTEM

Follow our simple step-by-step guide to buying a PC and get the perfect system for your needs

FILL IN YOUR SPECS HERE

(Recommended minimum in grey)

PROCESSOR: Athlon 64 3000+

MEMORY: 256MB DDR

HARD DISK: 120GB

STORAGE: 52X CD-RW/16X DVD
combo drive

SOUND: Integrated

SPEAKERS: Stereo

GRAPHICS: Integrated

MONITOR: 17" LCD

EXTRAS: 56K modem

CONNECTORS: 4x USB2.0, network

SOFTWARE: Windows XP Home Edition

BASICS: Keyboard, mouse

1

The minimum specification of PC we recommend, shown in grey opposite, is a good starting point when working out your ideal system. This PC would cost around £500 and is perfectly capable of running everyday office, multimedia or education software, as well as doing anything on the internet. But it's an unexciting PC. It will be able to play DVD movies, but they won't sound too impressive and games are a total no-no.

2

If you're interested in editing your own movies, you'll need a DVD rewriter. Make sure that you get one that supports both +R and -R formats. It's also worth getting one that will write double-layer discs, as this lets you squeeze twice as much information on a DVD.

There's not much difference in price between the different drive speeds, so we recommend getting one that can write DVD+R and DVD-R at 16X, and DVD+R DL at 4X. If you'll be doing a lot of video projects and disc writing, upgrade to a 200GB hard disk as a minimum.

3

Interested in games? Then upgrade to 512MB or 1GB of memory and a 200GB disk and get a graphics card. Budget cards based on the GeForce FX 5200 graphics processor or Radeon 9800 will cope with this year's games, but to play next year's just as smoothly (and enjoy gorgeous graphics today) you'll want anything up to a GeForce FX 7800GTX or Radeon X850XT. You'll also need a faster processor.

4

Which faster processor? Well, faster AMD processors such as the Athlon 64 3400+ are good value. An Athlon FX-based system will cost £300 more but offers much better performance. The alternative is a PC based on Intel's Pentium 4 processor. These are also pricier, but many people feel reassured by the Intel brand, and the fastest P4s always do well in our performance tests.

5

If you're really not interested in games you can definitely live with integrated or cheap graphics, but there are plenty more reasons to upgrade the memory, hard disk or processor.

If you'll use your PC for serious DTP, music or photo editing you need the same kind of processor, memory and disk as for games. For video editing, consider getting two hard disks, perhaps in a RAID array.

6

A quality sound system will enhance all manner of PC activities. To hear the surround soundtrack of a DVD at its best, you'll need a quality 5.1 speaker system. Games can also use such a system to throw sound effects around you. If you're interested in neither games nor DVDs (or don't want to trail wires all around the room), go for a quality stereo pair with a subwoofer to boost the bass instead.

If you're interested in music or want better-quality sound, you'll need to invest in a dedicated sound card. As well as providing enhanced sound, such as Environmental Audio eXtension (EAX), which tweaks the acoustics to make sound appear to be playing in different environments, you'll get higher-quality outputs and more inputs.

7

Although 17" LCD screens save on desk space and look stylish, the limited display size means some may find onscreen text hard to read. A 19" LCD will cost around £50 more, has the same resolution (1,280x1,024) and is easier on the eye. It's better for those who want to edit large photos, documents or spreadsheets, run two applications side by side, or just look important. Twenty-inch LCDs are available from £400 and have a higher resolution (1,600x1,200).

8

The standard set of connectors can be usefully improved with extra USB2 ports, to which most run-of-the-mill PC gadgets attach, and a FireWire port, for fancy gadgets including digital video (DV) cameras.

9

Windows XP Home Edition is preinstalled on most new PCs. Any extra software bundled should be assessed critically. It may be that you'll never actually use it. But equally, you may happen across a PC that includes software you'd otherwise have paid for, in which case you'll almost certainly save lots of money by having it preloaded, although you won't get technical support included.

10

Money left over? A TV card will let you watch television on your PC screen plus record programmes to your hard disk, or capture analogue video from a camcorder. Rather than splashing out on an extended warranty, pay extra to get the make of PC your friends or colleagues swear by.

